METHOD FOR CALIBRATING THE GEOMETRY OF A MULTI-AXIS METROLOGY SYSTEM

ABSTRACT OF THE INVENTION

A method for calibrating and aligning a metrology system comprising a machine including multi-axis part-positioning means and a wavefront-measuring gauge embedded in the machine. The gauge is used in determining spatial relationships among the translational and rotational axes, between part surface coordinates and machine coordinates, and between machine coordinates embedded gauge coordinates; in calibrating various components of the machine and the embedded gauge; and in aligning itself to the machine. A complete method comprises the steps of coarsely aligning the machine rotary axes with their respective translational axes and setting nominal zero points for the rotary axes; aligning the embedded gauge mainframe to the machine axes; aligning the embedded gauge focal point onto a spindle axis; determining the spatial offsets between the rotary axes when so aligned; precisely aligning the machine rotary axes with their respective translational axes; and setting precise zero points for the rotary axes.